

# Is assortative mating important for speciation in *Calopteryx* damselflies?



Anna K. Nordén\*, Erik I. Svensson & John Waller  
 Dept. of Biology, Lund University, SE-223 62 Lund, Sweden  
 \*E-mail: anna.norden@biol.lu.se

## SUMMARY

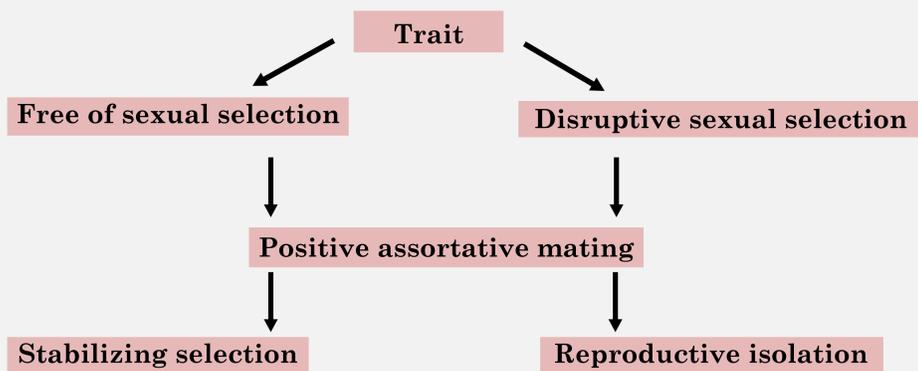
Assortative mating could, with sexual selection, play a crucial role in the speciation process. I quantified assortative mating strength and sexual selection of two sympatric damselfly species (*Calopteryx splendens* and *Calopteryx virgo*).

**Positive assortment was most common within both species and thorax width and length showed the greatest assortment strength. Surprisingly, there was no relationship between assortative mating and sexual selection.**

## 1. Introduction

Assortative mating is non-random mating resulting in a correlation of traits between individuals in mating pairs.

The evolutionary outcome of assortative mating on a trait depends on whether sexual selection is acting on the same trait simultaneously or not:



## Aims

1. Quantify the magnitude of assortative mating on morphological traits across species and field sites.
2. Investigate the relationship between assortative mating strength and standardized sexual selection differentials on the same morphological traits.

## Study species

*Calopteryx splendens*



*Calopteryx virgo*



## 2. Methods

For mated pairs and single individuals, we measured 9 and 8 morphological characters at two field sites located in Southern Sweden, Klingavälsåns Naturreservat and Sövdemölla Gård, respectively.



## 3. Results

- Majority of assortative mating strengths for both species were positive and concordant (Figures 1&3)
- Thorax traits were significant for assortative mating correlations (Figure 2)
- The strength of assortment was dependent on type of morphological trait
- No significant correlation was found between assortative mating and sexual selection

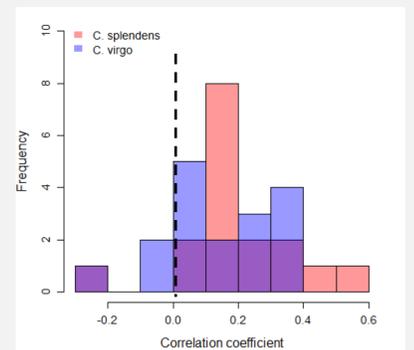


Figure 1. Histogram of the assortative mating strength (correlation coefficients) of all morphological characters for *C. splendens* and *C. virgo*. The dashed line is for reference  $x = 0$ .

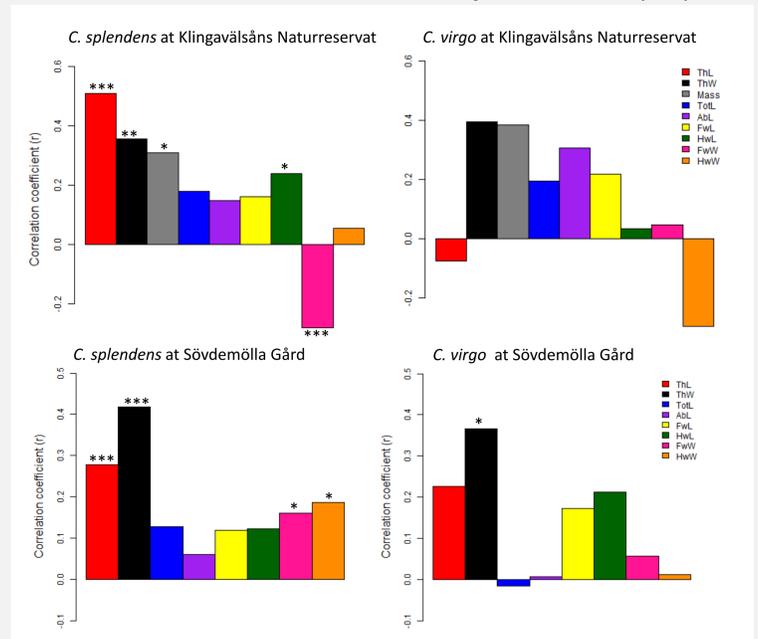


Figure 2. Comparison of the assortative mating strength among all populations. Asterisks indicate level of significance.

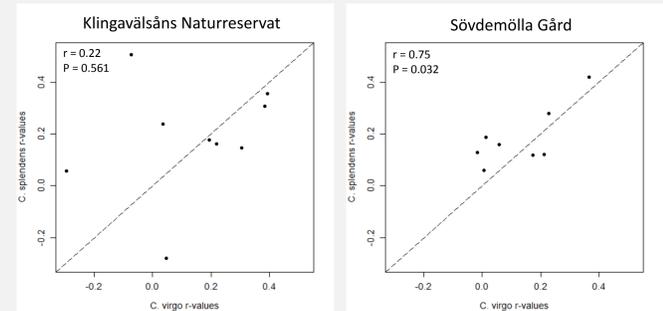


Figure 3. Relationship between assortative mating coefficients (Pearson correlation) of *C. splendens* and *C. virgo*, by field site. The dashed line is a reference line with a 1:1 slope. The relationship was positive and concordant at both field sites, although only significant at Sövdemölla.

## 4. Conclusions

- Thorax was an important assortment trait in both species, which may lead to stabilizing selection
- Assortative mating and sexual selection are operating quite independently of each other on the measured traits
- As the correlation between species is positive, hybridization is not hindered and reproductive isolation on these traits is unlikely
- The investigated traits do not aid any speciation process for *C. splendens* and *C. virgo*

## 5. Future research

Incorporate behavioural traits:

– Flight behaviour? Maybe that is connected to thorax width?



## Acknowledgements

I would like to thank Sophia Engel and Johanna Eklund for collecting field data and Jessica Abbott for helping me with programming in R. This project was funded by Vetenskapsrådet (the Swedish Research Council).



**Anna K. Nordén**

I am currently a PhD student at Lund University working on sexual antagonism in a hermaphroditic flatworm.

Email: anna.norden@biol.lu.se  
 Phone: 0046767680483